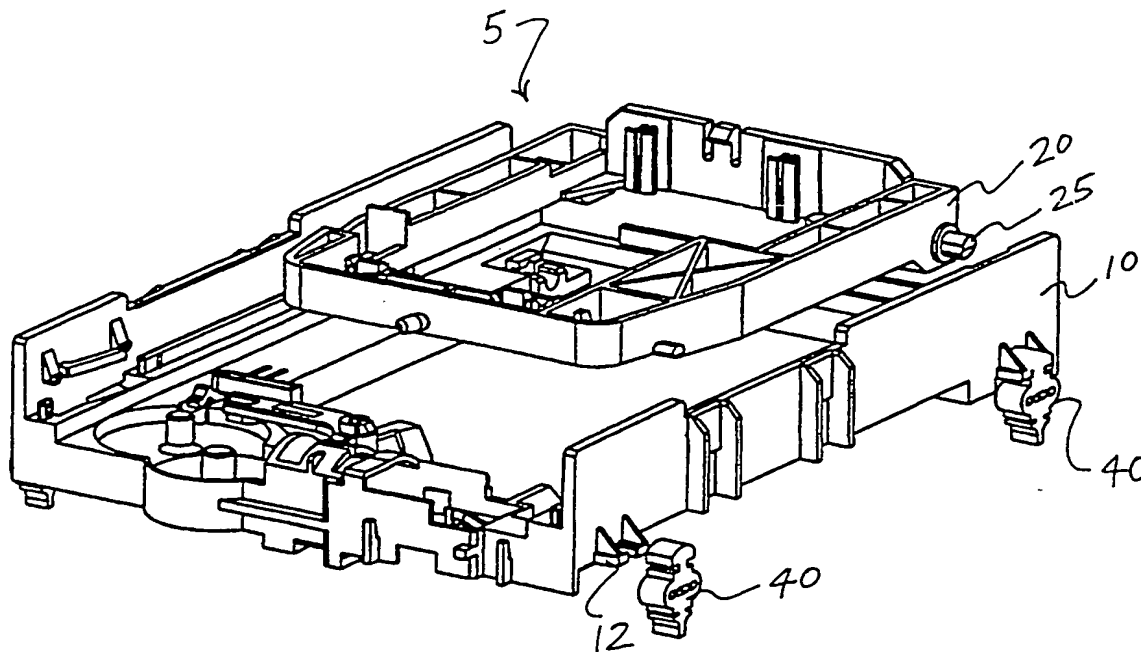


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/SG97/00062  <b>(22) International Filing Date:</b> 18 November 1997 (18.11.97)  <b>(30) Priority Data:</b> 9611326-1                      20 November 1996 (20.11.96)      SG  <b>(71) Applicant:</b> OMNI PERIPHERALS PTE LTD. [SG/SG]: 118 Innovation Centre, Nanyang Technological University, Nanyang Drive, Singapore 639798 (SG).  <b>(72) Inventors:</b> NGUYEN, Michael, Anh; 548 Choa Chu Kang Street 52, #05-27, Singapore 680548 (SG). LI, Yong; Block 511, Bukit Batok Street 52, #07-193, Singapore 650511 (SG).  <b>(74) Agent:</b> HO, Lawrence, Y., D.; Thongsia Building, 30 Bideford Road #07-02/03, Singapore 229922 (SG).		<b>(81) Designated States:</b> CN, DE, GB, JP, KR, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** A FLOATING FRAME FOR OPTICAL STORAGE DEVICE LOADING MECHANISM

**(57) Abstract**

A floating frame for an optical disc loader (5). It includes a pivoting-type sub-chassis (20) of 1-degree of freedom of movement. It is rigidly connected to a chassis (10) without any floaters (40). Floaters (40) are placed at the four corners of the chassis (20) to support the entire loader (5). The floater (40) has a wide mid-section and a narrow tip. Above the mid-section are upper slots, and below the mid-section are lower slots. The floater (40) should preferably be made of flexible material such as rubber.

## A FLOATING FRAME FOR OPTICAL STORAGE DEVICE LOADING MECHANISM

### FIELD OF THE INVENTION

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The present invention relates to the field of optical storage or disc players, and in particular to a floating frame for optical disc loader to reduce the vibration experienced by an optical disc when rotating at high speeds.

### 10 BACKGROUND OF THE INVENTION

In the optical disc drive industry, there is an ever-increasing competition to increase the rate at which the data can be transferred from a disc to a peripheral device. In order to achieve the higher speeds, the drive  
15 must be able to spin the disc at correspondingly increased rotational speeds. So for instance, a 4x CD-ROM drive should be able to spin the CD-ROM disc about twice as fast as that of a 2x drive. With increased rotational speeds, however, the disc experiences increased vibration. This vibration, which increases exponentially with speed, is a serious problem which can  
20 significantly hinder the drive's performance. Intermittent data streaming, for example, is one such a problem where the drive is unable to read some of the data off the CD-ROM. This problem may make video applications inoperable, or may unduly slow down other applications due to extended error recovery time.

25 The main causes for the drive vibration are the high linear acceleration of the optical pickup unit and the eccentricity of the system. There are two sources for the eccentricity: the spindle turntable and the optical disc. The disc eccentricity is the major contributor to the drive's vibration and this problem becomes even more significant as drive speed increases.

the four corners of the chassis to support the entire loader. The floater has a wide mid-section and a narrow tip. Above the mid-section are upper slots, and below the mid-section are lower slots. The floater should preferably be made of flexible material such as rubber.

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## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the floating frame for an optical disc loader with the improved vibration dampening features.

FIG. 2 is a perspective view of the optical disc of FIG. 1 with the sub-chassis and one of the floaters removed for better viewing.

FIG. 3 is an enlarged perspective view of a floater.

FIG. 4 is a perspective view of the optical disc loader of FIG. 1 mounted in an optical disc drive cover.

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## DETAILED DESCRIPTION OF THE INVENTION

As alluded to in the Background portion, the previous optical disc loaders utilized a floating sub-chassis to dampen the vibration generated by the traverse mechanism as it rotates an optical disc at high rotational speeds. The present invention, however, is a frame for an optical disc loader with a sub-chassis which is rigidly connected to a chassis without any floaters to support the sub-chassis. The floaters are instead provided on the outside of the chassis to "float" the entire loader.

enough to allow the tip 48 of the floater 40 to enter, but must be narrow enough to snugly mate with the lower slots 44.

It should be understood by those skilled in the art that while the preferred embodiment has been shown here as a way of fully disclosing the invention, many variations are possible without departing from the scope and spirit of the present invention. For instance, although a pivoting type sub-chassis was shown here, it should be understood that other types of sub-chassis may be used as well. In addition, although four floaters were shown here where they were attached to the four corners of the chassis, less than four floaters may be used and be attached to the chassis in other configurations so long as they perform the function of floating the loader. Many such modifications not mentioned herein are also possible. Accordingly, it is intended by the appended claims to cover all such modifications and changes as falling within the true spirit and scope of the present invention.

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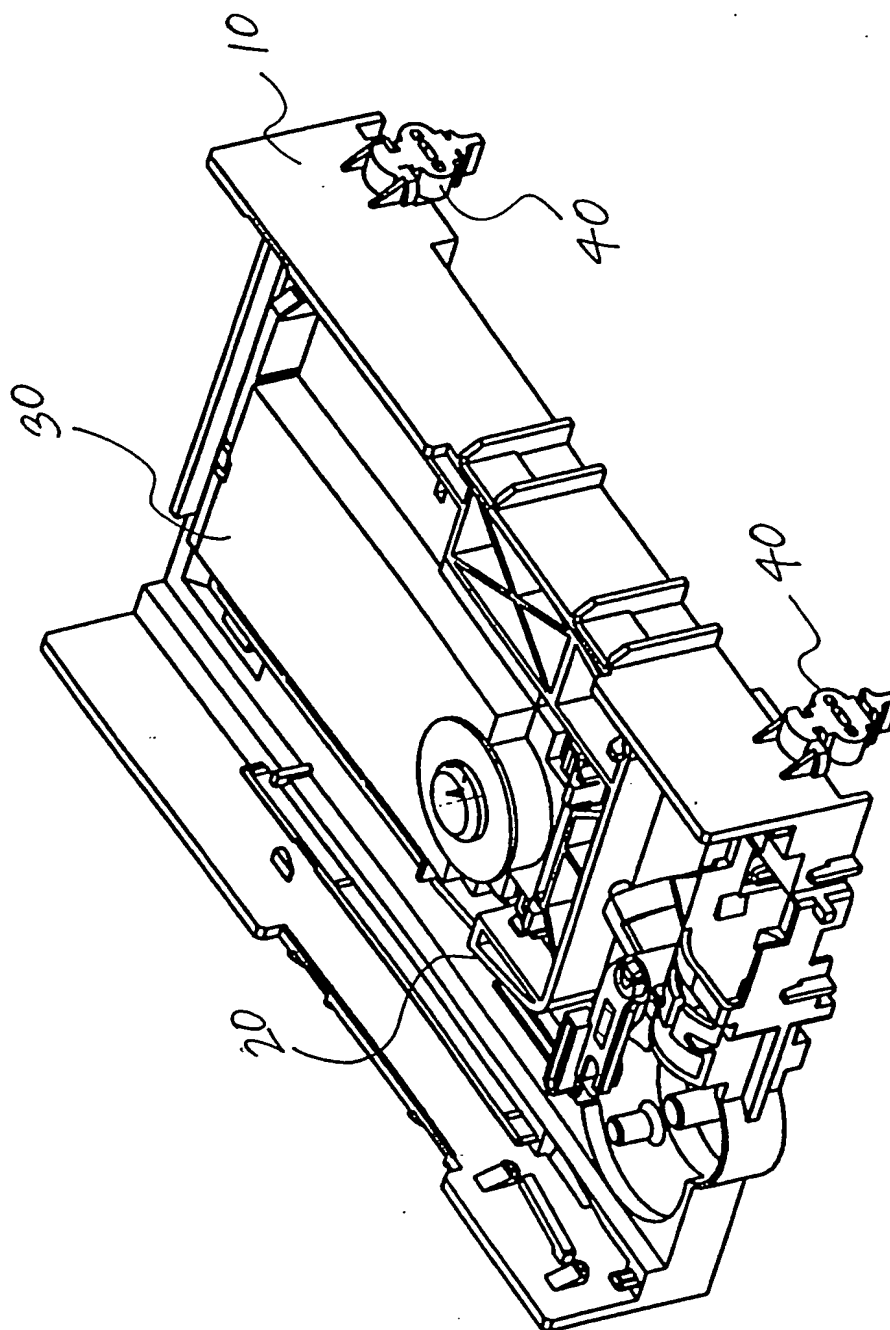
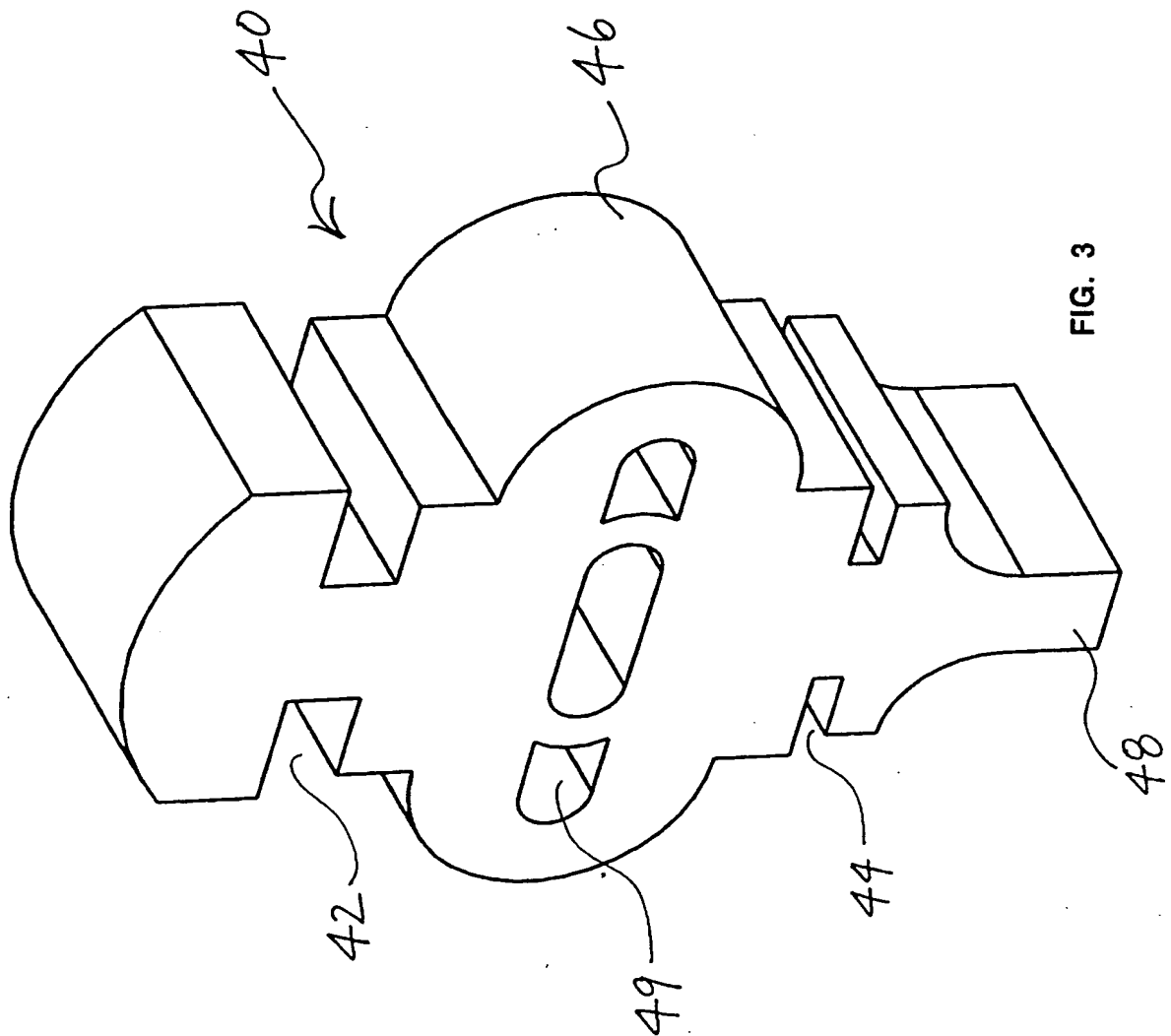



FIG. 1



# INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/SG 97/00062

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>																						
Int Cl <sup>6</sup> : G11B 33/08																						
According to International Patent Classification (IPC) or to both national classification and IPC																						
<b>B. FIELDS SEARCHED</b>																						
Minimum documentation searched (classification system followed by classification symbols) IPC G11B 33/08, F16F 15/02																						
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																						
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)																						
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																						
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																				
A	US,A, 4922478 (VERHAGEN) 1 May 1990 see whole document.																					
A	EP,A, 779625 (SAMSUNG ELECTRONICS CO., LTD) 18 June 1997 see whole document.																					
A	US,A, 5642344 (YAMADA et al) 24 June 1997 see whole document.																					
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex																						
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A"</td> <td>document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T"</td> <td>later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E"</td> <td>earlier document but published on or after the international filing date</td> <td>"X"</td> <td>document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"I."</td> <td>document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y"</td> <td>document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O"</td> <td>document referring to an oral disclosure, use, exhibition or other means</td> <td>"&amp;"</td> <td>document member of the same patent family</td> </tr> <tr> <td>"P"</td> <td>document published prior to the international filing date but later than the priority date claimed</td> <td></td> <td></td> </tr> </table>			"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E"	earlier document but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"I."	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family	"P"	document published prior to the international filing date but later than the priority date claimed		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention																			
"E"	earlier document but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone																			
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"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family																			
"P"	document published prior to the international filing date but later than the priority date claimed																					
Date of the actual completion of the international search 13 February 1998		Date of mailing of the international search report <b>25 FEB 1998</b>																				
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No.: (02) 6285 3929		Authorized officer  S. LEE Telephone No.: (02) 6283 2205																				

### Information on patent family members

**PCT/SG 97/00062**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
US	4922478	EP	288126	NL	8700969		
EP	779625	JP	9167482				
US	5642344	CA	2130688	EP	643392	JP	7114789
US	5668791	CA	2130688	EP	643392	JP	7114789